NAME Key Date _____ Pd _____

Matrices Test Review

☑ Use when you get it right all by yourself

S Use when you did it all by yourself, but made a silly mistake

H Use when you could do it alone with a little help from teacher or peer

G Use when you completed the problem in a group

X Use when a question was attempted but wrong (get help)

N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Dimensions, addresses, naming matrices	14, 15	16 - 20	25
Adding/Subtracting Matrices	8, 9	1	4, 5
Scalar Multiplication with Matrices	10	1	4
Multiplying Matrices	12, 16 - 20	2, 11	3
Geometric Transformations with Matrices	27	27	27
Determinants of Matrices, including area of a triangle	6	7	26
Inverses of Matrices including solving systems	13, 22	21, 23, 24	
Solving Systems with Cramer's Rule		23, 24	

On the test you will be responsible to complete the test with or without a calculator. The calculator should be used to check and occasionally solve a problem more efficiently. No partial credit will be awarded without proper work shown.

1-3: Perform the following operations .Be sure to be able to do them both by hand and using the calculator!

$A=\begin{bmatrix}3 & 1\\ -5 & 2\end{bmatrix}$ $B=\begin{bmatrix}3 & -1\\ -5 & 2\end{bmatrix}$ $C=\begin{bmatrix}-6 & 0\\ 4 & 3\end{bmatrix}$ $D=\begin{bmatrix}7 & -2 & 9\\ -4 & 1 & -8\end{bmatrix}$ $E=\begin{bmatrix}7 & 2 & 9\\ 4 & 1 & 8\end{bmatrix}$

1. Find $2C-B$ $\begin{bmatrix}-15 & 1\\ 13 & 4\end{bmatrix}$

2. Find $A\cdot E$ $\begin{bmatrix}25 & 7 & 35\\ -27 & -8 & -29\end{bmatrix}$

3. Find B^2 $\begin{bmatrix}14 & -5\\ -25 & 9\end{bmatrix}$

4. Find K so that $D-2K=\begin{bmatrix}2&0&3\\0&1&-4\end{bmatrix}$

$K=\begin{bmatrix}\frac{5}{2}&-1&3\\-2&0&-2\end{bmatrix}$

5. Solve for x, y and z given: $\begin{bmatrix}x^2&y+z\\-2&1\end{bmatrix}=\begin{bmatrix}9&-7\\2z-y&1\end{bmatrix}$

$x=\pm 3;\ y=-4;\ z=-3$

6. Find $\begin{vmatrix}2&-1&-3\\4&0&1\\-2&-3&5\end{vmatrix}$ = 64

7. Solve for x: $\begin{vmatrix}8&3&-1\\2&1&-2\\4&1&x\end{vmatrix}=14$

$x=10$

8-15: Perform the following operations .Be sure to be able to do them both by hand and using the calculator!

$A=\begin{bmatrix}3&4\\1&-2\\0&-1\end{bmatrix}$ $B=\begin{bmatrix}4&0\\0&4\end{bmatrix}$ $C=\begin{bmatrix}1&-1\\3&2\\5&-1\end{bmatrix}$ $D=\begin{bmatrix}-2&1&4\\-1&0&3\end{bmatrix}$ $E=\begin{bmatrix}1&-2&3\\-5&0&1\\-1&4&2\end{bmatrix}$

8. $A+B$

$A_{3\times 2}+B_{2\times 2}$ not Possible dimensions don't match

9. $C-A$

$\begin{bmatrix}-2&-5\\2&4\\5&0\end{bmatrix}$

10. $-2D$

$\begin{bmatrix}4&-2&-8\\2&0&-6\end{bmatrix}$

11. BD

$\begin{bmatrix}-8&4&16\\-4&0&12\end{bmatrix}$

12. AC

$3\times\cancel{2}$ $\cancel{3}\times 3$ 3×2 $\cancel{3}\times\cancel{2}$ not possible

13. E^{-1} (calculator)

$\begin{bmatrix}\frac{2}{41}&\frac{-8}{41}&\frac{1}{41}\\\frac{-9}{82}&\frac{-5}{82}&\frac{8}{41}\\\frac{10}{41}&\frac{1}{41}&\frac{5}{41}\end{bmatrix}$

14. What number is in c_{22}?

2

15. State the dimensions of AD.

$AD_{3\times 3}$

16 – 20: Given that $A_{5\times2}$, $B_{2\times5}$, $C_{1\times5}$, and $R_{5\times2}$, state what the dimensions of the products would be, if they are defined.

16. AB	17. CB	18. AR	19. RB	20. CA
5x5	undefined	undefined	5x5	1x2

21 – 22: Determine the inverse of the matrix provided. Fractions only, no decimals!!

21. $\begin{bmatrix} 2 & -3 \\ 4 & 1 \end{bmatrix}$

$\begin{bmatrix} \frac{1}{14} & \frac{3}{14} \\ -\frac{2}{7} & \frac{1}{7} \end{bmatrix}$

Calculator

22. $\begin{bmatrix} -1 & 4 & 0 \\ 2 & 1 & 1 \\ -3 & -2 & 1 \end{bmatrix}$

$\begin{bmatrix} -\frac{3}{23} & \frac{4}{23} & -\frac{4}{23} \\ \frac{5}{23} & \frac{1}{23} & -\frac{1}{23} \\ \frac{1}{23} & \frac{14}{23} & \frac{9}{23} \end{bmatrix}$

23 – 24: Solve using inverse matrices. Set up a matrix equation first! Then also solve using Cramer's Rule.

23. $\begin{cases} 3x - y = 6 \\ x = 2y + 1 \end{cases}$

$\left(\frac{11}{5}, \frac{3}{5}\right)$

$d = -5$

$d_1 = -11$

$d_2 = -3$

24. $\begin{cases} x + 2y + 1 = 0 \\ 2x - y - 3 = 0 \end{cases}$

$(1, -1)$

$d = -5$

$d_1 = -5$

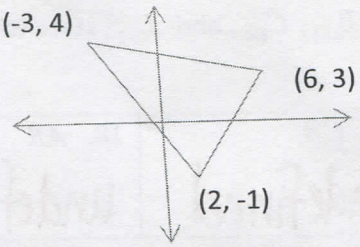
$d_2 = 5$

25. Solve the matrix for the missing variable.

$$\begin{bmatrix} 4 & 2x+3 \\ 5y-1 & 2 \end{bmatrix} = \begin{bmatrix} 4 & -1 \\ 2y & 2 \end{bmatrix}$$

$x = -2;\ y = \frac{1}{3}$

26. Use a determinant to find the area of the triangle shown.



$20u^2$

27. If ΔABC is defined by the matrix, $T = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$, what are the coordinates of the triangle after it has been...

a) rotated 90 degrees counter-clockwise? $\begin{bmatrix} -4 & -5 & -6 \\ 1 & 2 & 3 \end{bmatrix}$

b) 90 degrees clockwise? $\begin{bmatrix} 4 & 5 & 6 \\ -1 & -2 & -3 \end{bmatrix}$

c) Reflected over the x-axis? $\begin{bmatrix} 1 & 2 & 3 \\ -4 & -5 & -6 \end{bmatrix}$

d) Reflected over the y-axis? $\begin{bmatrix} -1 & -2 & -3 \\ 4 & 5 & 6 \end{bmatrix}$

e) Rotated 180 degrees? $\begin{bmatrix} -1 & -2 & -3 \\ -4 & -5 & -6 \end{bmatrix}$

f) Dilated by a factor of $\frac{2}{3}$? $\begin{bmatrix} \frac{2}{3} & \frac{4}{3} & 2 \\ -\frac{8}{3} & \frac{10}{3} & 4 \end{bmatrix}$

g) Translated 1 unit to the left and 4 units down? $\begin{bmatrix} 0 & 1 & 2 \\ 0 & 1 & 2 \end{bmatrix}$

h) Reflected over the x-axis and dilated by a factor of 4? $\begin{bmatrix} 4 & 8 & 12 \\ -16 & -20 & -24 \end{bmatrix}$

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.